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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,315	12/16/1999	TAN DU	TI-29436	7360

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TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER
MAKHDOOM, SAMARINA

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/464,315	Applicant(s) DU ET AL.
	Examiner Samarina Makhdoom	Art Unit 2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **delay element** must be shown or the feature(s) canceled from the claim(s). Examiner objects to Figure 5 where AND gate 178 is labeled with the term Delay. An AND gate's output signal can trigger a delay but the AND gate is not the delaying component of this circuit. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application.

Figures 1 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figure 1 should be labeled as prior art, (see applicant's specification page 1, lines 25-26). Figure 3 should be labeled as prior art, (see applicant's specification, page 8, lines 7-9)

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6, 11, and 17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 6, 11, and 17, claim a 'delay element' that is neither fully described in the specification nor drawings. As for the specification, the only element with 'delay' written under it is an AND gate (178, Figure 5). The specification states that the AND gate 178 can have "a predetermined delay, if desired, depending upon the particular circuit requirements." It is unclear how the AND gate could have a variable delay depending on the circuit requirements. Therefore, one of ordinary skill in the art would not be enabled to make the disclosed invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6, 11, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6, 11, and 17, these claims recite 'to delay the eddy current opposing current'. It is not clear what the eddy current opposing current' represents. For this office action, it is assumed that the eddy current opposing current is the drive current.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-27 are rejected under 35 U.S.C. 103 as being obvious by Ebihara et al. U.S. Patent No. 5,247,410 in view of Williams et al. "Design and operation of a fully integrated BiC/DMOS head-actuator PIC computer hard-disk drives."

Ebihara et al. teach a circuit to determine a velocity of a Voice Coil Motor to which a driving current is applied in a magnetic field, comprising:

a circuit to terminate the driving current in said coil; (Col 5, lines 29 et Seq for driving current)

a circuit to apply a current to said coil to create a magnetic field to oppose eddy currents established in structures adjacent said coil by said driving current; and (Col. 7, lines 14 et Seq)

Ebihara et al. teach a driving current is in a first direction in said coil, and wherein said circuit to apply a current to said coil applies a current in a direction opposite said first direction. (See Col. 6, lines 29 et Seq for driving current and opposite current)

Ebihara et al. teach a circuit to apply a current to said coil applies a current for a time directly related to a magnitude of the original current command after said driving current has been terminated. (See Col. 5, lines 29-37 where a prescribed drive current is applied once the disk reach a prescribed speed)

Ebihara et al. teach a circuit to apply a current to said coil applies a current for a time directly related to a magnitude of said driving current prior to when said driving current has been terminated. (See Col. 5, lines 29-37 where a prescribed drive current is applied once the disk reach a prescribed speed)

Ebihara et al. teach a circuit to determine a voltage of a VCM coil after termination of a driving current in a first current direction in said coil, comprising:

a circuit for activating selected VCM coil driver transistors to apply a current to said coil in a direction opposite said first current direction to generate a magnetic field to oppose eddy currents established in structures adjacent said coil by said driving current. (See Col. 6, lines 10-34 where the secondary currents effect the drive current, and the secondary current flow in the opposite direction when the drive current is decreasing.)

Ebihara et al. teach a circuit for activating selected VCM coil driver transistors applies said current to said coil for a time directly related to a magnitude of the original current command after said driving current in said first direction has been terminated. (See Col. 5, lines 29-37 where a prescribed drive current is applied once the disk reach a prescribed speed)

Ebihara et al. teach a circuit for activating selected VCM coil driver transistors applies said current to said coil for a time directly related to a magnitude of said driving current prior to

when said driving current has been terminated. (See Col. 5, lines 29-37 where a prescribed drive current is applied once the disk reach a prescribed speed)

Ebihara et al. teach a circuit for use in determining a velocity of a head assembly of a VCM after termination of a driving current in a coil of said VCM, comprising:

a circuit for activating selected VCM coil driver transistors to apply a current to said coil of said VCM to create a magnetic field that opposes eddy currents established in structures adjacent said coil by said driving current. (See Col. 6, lines 10-34 where the secondary currents effect the drive current, and the secondary current flow in the opposite direction when the drive current is decreasing.)

Ebihara et al. teach a circuit for activating selected VCM coil driver transistors applies a current to said coil in a direction opposite said first current direction. (See Col. 6, lines 10-34 where the secondary currents effect the drive current, and the secondary current flow in the opposite direction when the drive current is decreasing.)

Ebihara et al. do not expressly disclose the calculating the BEMF, flyback current, transistors, or the delay element.

Williams et al. teach calculating the BEMF of a head Actuator (See pages 1597-1598, Section D. Interval 4: Deceleration). The applicant's specification teaches that the head actuator and positioning circuits are part of the VCM (See Page 1, lines 8-13). Williams et al. also teach the flyback current (See pages 1595-1596, Section C. Interval 3: Current Reversal) and the use of transistors (See Figure 2). Williams et al. also give details on terminating (or putting in an off-condition) the drive current, (See Pages 1591 last paragraph of right column that is continued on the next page.) As for the delay element, see Figure 1, on page 1591.

It would be obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Ebihara et al. with the teachings of Williams et al. because it would result in a more accurate calculations of the electric current and magnetic force effects of the VCM. Ebihara et al invention relates to a head positioning system as part of a Voice Coil Motor for a magnetic disk drive Williams et al. invention relates to a head positioning system called a head actuator for a magnetic disk drive. Williams et al. teach the calculation of BEMF and flyback currents that are inherent to Ebihara's Voice Coil Motor. Williams et al also teach the use of transistors and delay elements that are inherent to control circuitry used for head positioning on magnetic disk drives.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Morris et al. U.S. Patent No. 5,206,555 discloses a disk drive actuator including automatic eddy-current braking capability.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samarina Makhdoom whose telephone number is 703-305-7209. The examiner can normally be reached on Full Time on Tuesday, Thursday, Friday, and Sunday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin J. Teska can be reached on 703-305-9704. The fax phone numbers for the

organization where this application or proceeding is assigned are 703-305-0040 for regular communications and 703-305-0040 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

SM
September 8, 2002

Wm. Thomson
AU. 2123
Sept. 8, 2002